The Northwestern MILLER

MILLING PRODUCTION SECTION

A Report of the 1952 AOM Technical Conference

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Technical Changes Predicted by Executive at AOM Conference

BUFFALO—A tremendous change in the next five years in milling technology was predicted by Harry C. Lautensack, eastern divisional president of General Mills, Inc., in his address "Welcome, Management," presented at the opening session of the 56th annual conference of the Association of Operative Millers in Buffalo May 19-23.

Mr. Lautensack said that it was his opinion that there would be a complete revolutionizing of methods in manufacture of flour. "We must plan and build for the future," Mr. Lautensack declared. "The high cost of operating obsolete plants will make it necessary for the industry to erect more efficient plants and more efficient ways of making flour."

Mr. Lautensack said that during the past 50 years the milling industry has seen a great increase in population in this country and a great decline in the per capita consumption of flour. That figure, he said, has declined from 204 lb. to 133 lb. along with a doubling of the population of the U.S. Some of the reasons he said were competition of other foods for the consumer dollar and a lack of promotion of wheat flour and its products.

The milling industry now is faced with a tremendous problem to hold and regain its output figures. In addition to a decline in the per capita consumption of flour, Mr. Lautensack pointed out, there has been a decline in flour exports. In 1900, he said, this country exported 26 million sacks of flour and the low figure for exports was in 1933 with slightly less than 9 million sacks. The exports, he said, in 1951 amounted to 22 million sacks. Mr. Lautensack traced the decline in the number of flour mills during the past 50 years, saying that in 1900 there were about 10,000 flour mills, each producing an average of 20,000 sacks a year and more than 50 years later the number of mills had declined to about 1,000 while the total output remained relatively stable. He pointed out that the industry is not producing any more flour today than it was 50 years ago in spite of the doubling of the population.

Record Enrollment in Correspondence Course by AOM

Donald S. Eber, executive secretary of the Association of Operative Millers, reported that there are approximately 165 students currently enrolled in the organization's correspondence course. He said that the correspondence course, which was written by 43 qualified men in the milling industry, is proving to be very successful in training millers on their jobs. Mr. Eber reported that the course was prepared for use by students with a high school level of education but that some of the material in mathematics and physics was proving to be a "challenge" to the men who might have forgotten some of their arithmetic.

Mr. Eber supervises the administration of the course and grades all of the lesson answer sheets which are either true-false or multiple choice types of questions. He said in a few instances it has been apparent that the students have not had the background education necessary to take the course, and they have been advised to drop it. The AOM charge for the course is $15 for one unit of 12 lessons or $60 for the complete course. The average student, Mr. Eber said, requires about 9 months to complete each unit and he said that he was very well pleased with the results which have been obtained. Mill management, he said, was very appreciative of the efforts of the Association of Operative Millers in making the course available to its members.

Instructor Reports on Use of Course Text in Classroom

John J. Womack, plant engineer for General Mills, Inc., Kansas City, presented a report on the use of the AOM correspondence course as a textbook for classroom instruction in flour milling. The report was presented at the May 20 session of the annual technical conference of the organization at Buffalo.

Mr. Womack, in prefacing his re-

(Continued on page 6a)

'What's New' Symposium a Feature of Operative Millers' Conference

BUFFALO—Manufacturers of milling machinery and equipment were given an opportunity, at the 56th annual technical conference of the Association of Operative Millers, to present a formal description of their various products as one of the features of the technical conference.

The custom, inaugurated at the 1950 conference, has found ready acceptance with the operatives and the manufacturers alike. Each manufacturer who wants to appear on the symposium is allotted a definite time to tell about his company's new product.

Prof. John M. MacKenzie, chairman of the AOM research committee, presided at the "What's New" symposium. This was in keeping with a policy inaugurated this year providing the various committees with the responsibility of organizing and presenting a certain portion of the program.

In introducing this phase of the morning session, Prof. MacKenzie pointed out that this symposium provided the industry with an opportunity to reach out and welcome the new ideas and techniques offered by the representatives appearing on the program.

He also noted that it is impossible to foresee or obtain information on all of the new developments that might be presented and that any oversights were the responsibility of the research committee and subject to correction at future meetings.

The "What's New" presentation was the opening symposium of the 1952 conference.

Impact Mill Described

The first speaker on the "What's New" session, Robert Hoskins, Entoleter division, Safety Car Heating and Lighting Co., presented the description and a typical application of the new 27-in Entoleter impact mill. Mr. Hoskins pointed out that the increased diameter of the new impact mill has raised the maximum tip speed from 14,000 ft. a minute to 22,000 ft. a minute, which enables the mill to effectively reduce the particle size on such fine material as soft wheat cake flour. Mr. Hoskins presented slides to show the construction of the machine and to show the amount of reduction obtained upon various fractions of a soft wheat flour.

Fractionating Aspirator

The second speaker on the "What's New" portion of the program, William Burnet, chief engineer, Superior Separator Co., Hopkins, Minn., described the new fractionating air aspirator developed by the Superior Separator Co., for the purpose of making multiple separations on grain or granular stocks by means of controlled air velocity aspiration. Mr. Burnet presented slides to show the construction and principles of operation of the equipment. This presentation was brought before the membership in order to point out the need for encouraging better control of aspiration in the removal of insect fragments from internally infested wheat.

Dust Control

Because of the increasing interest of improved sanitation in grain storage and grain cleaning operations, the research committee called on the Day Co., represented by Max Springer, chief engineer, to present the story on central dust control systems for grain cleaning machinery. Mr. Springer illustrated typical installations and briefly presented the advantages of central systems as compared with the individual fan and dust collector units applied to the original equipment. Mr. Springer pointed out that proper design and balancing of air requirements permitted self-cleaning duct systems to operate over longer periods of time with less maintenance and at a lower over-all power cost for the air handling operation. In addition, the use of a large central dust collector permits the installation of a more efficient dust collector at a lower cost per cubic foot of air handled than would be possible by the installation of individual units at the machines.

New developments in pneumatic transport were announced by H. K. Swan, manager of the Grain and Chemical Processing Division, Allis-Chalmers Manufacturing Co. Mr. Swan pointed out that Allis-Chalmers has spent over a quarter million dollars in the development of sifters, purifiers and roll stands which meet the sanitary requirements of the industry as well as a new pneumatic

(Continued on page 14a)

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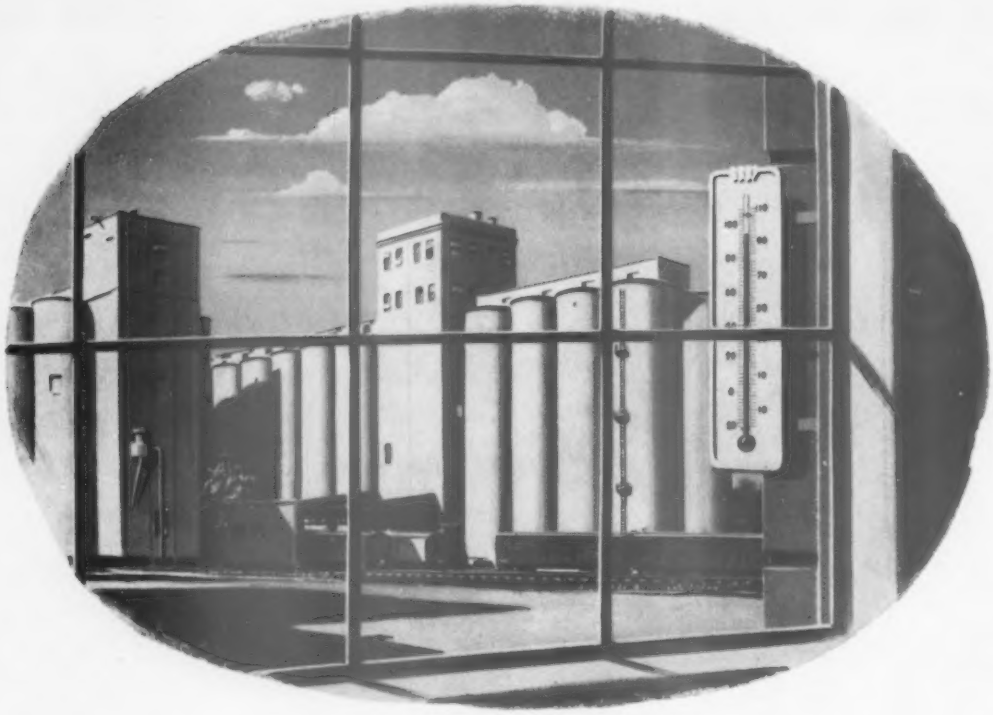

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An English Miller's Impressions of

American Mills and Milling Methods

A BRITISH miller has supplied his contemporaries in the U.S. with the answer to an oft-repeated wish "to see ourselves as others see us." The miller, H. S. Burgess of T. Burgess & Sons, Pickering, Yorkshire, England, visited this country last year and attended the conventions of the Association of Operative Millers and the American Association of Cereal Chemists.

Recently Mr. Burgess was the principal speaker at a meeting of the Hull, England, Flour Milling Students' Society and gave the students the benefit of his observations and impressions about mills and millers in the U.S.

Referring to the conventions of the two technical associations, Mr. Burgess said: "These functions are most interesting and informative, starting the day at 8:30 a.m. with normal business meetings for an hour or so, and continuing with a series of lectures until late afternoon. Although I did not attend every lecture," he said, "I picked out several of the most interesting, which were sufficient to convey to me the extent and scope of the milling activities in the U.S. and I must say they do cover a wide field."

The remainder of this article is reprinted from a current issue of Milling, British industry journal, and consists of the text of Mr. Burgess' address to the students.

We in this country have become so accustomed to government control that we have forgotten a lot of what competition stands for, and as American milling exists under the most severe competition, there is naturally much which cannot be compared at the present time.

Between the two world wars, American millers had little money to spend on new machinery, for long-standing surplus capacity in their industry had sharpened competition and kept profits low. The milling engineering industry, cramped by the small demand for its products, was itself small, and was carried on by a large number of small firms. These firms in turn could not afford to spend much on new developments; none of them to this day, manufacture a complete range of milling machinery, although two or three make roller mills, purifiers and plansifters, and there are several that manufacture particular wheat-cleaning machines. The American milling engineers have practically no export market for their machinery and this, too, has prevented them from building up a very efficient organization or from spending much on development.

American businessmen are among the most alert and enterprising in the world, and today, for a variety of reasons, American millers are in the process of conducting a spontaneous inquiry into the state of their industry. In the technical field, as I shall tell you in more detail later, they are coming to many progressive conclusions, whilst American milling engineers are working hard to modify their machinery according to demands which the millers are now expressing for the first time. It will be most interesting to see how much of the technical progress we have achieved will prove to be possible in American economic conditions.

Dry Milling

In America, the millers have only needed to make a low extraction of flour, and their work has been made easier by the abundance of first-class wheat at low prices. Millers did not need to use any but the best wheats, for second quality wheats and the by-products for flour milling, too, could be readily sold for stock and poultry feeding or other purposes. Furthermore, the law forbids the milling of flour with a moisture content greater than 13.5%. The products of such dry milling show a reasonably small evaporation loss, and are not so likely to cause sweating in the machines, even when the rolls are allowed to run comparatively hot. The Americans have, consequently, been able to work with very small roll surfaces. High wage rates have, as you know, existed in America for a long time, which has had the effect of reducing manual operations to a minimum.

Planning and Erection

The American miller does not use milling engineers to the same extent that the British miller does. Most American mills employ a milling superintendent, who is the milling expert of the firm and is often something of an engineer as well; he is frequently jealous of his reputation as a miller and has strong ideas of his own, which he tries to incorporate in the mills that he supervises. This is very different from England, where most milling firms look to the milling engineers to give them the best mill and diagram and then employ an experienced miller to run the plant on orthodox lines. Very few American mills are built the British way, with diagram, machinery, plans, erection and start-up all done by one firm of engineers; one often finds, in fact, that the diagram is that of the milling superintendent, or of the one or two individuals in America who offer their services as "flow sheet experts," the machinery is supplied by three or four firms, the planning and erection are done by another firm and the start-up is carried out by the milling superintendent. The start-up and early operation of the mill in such cases often entail months of expensive alteration, and when the plant is at last running well, improvements are only carried out as they occur to the superintendent.

Simple Conditions

All the conditions mentioned above as applying to America—dry milling, low extraction and a plentiful supply of wheat through peace and war—have produced very simple milling plants, using the fewest possible machines. Further, the keen competition during the inter-war years reduced profits to such an extent that flour mills lacked the financial means to improve their milling results by making their plants more efficient. On account of the simple milling conditions they also lacked the incentives that have been a spur to progress in other countries. As regards the machinery used for wheat cleaning, the Americans provide much more scouring, sometimes as many as three scourers, and rather less aspiration than we do. In addition, more feed is put on to a machine; in other words, the capacity of the machine is rated higher than it would be in England. The result is that though the American wheat cleaning plant is reasonably satisfactory for clean, good quality wheats containing few impurities, it would not be satisfactory for this country. As regards conditioning, the American plants are as simple as could be imagined, consisting usually of a tap and worm conveyor.

Roll Surfaces

With regard to roll surface, a total of about 35 in. per sack is all that one normally finds in an American mill—that is, one third of the surface usually found in this country. Most American millers admit that this is too short but think that about 50 in. per sack would be enough. With such short surfaces in spite of higher roll speeds, there is a mass of stock passing through the rolls in a hot, unevenly ground condition. The rolls are so hot that it is hardly possible to keep one's hand on them for more than a second or two. The Americans use rather finer flutes than we use and their flutes are always placed dull to dull which is more satisfactory for the dry milling conditions found in America. American diagrams are much simpler than ours. The break plansifters make the different grades of semolina, which are then sent straight to the purifiers instead of first passing through semolina graders. Moreover, stocks of widely differing granulation and quality are mixed together in a way that would be considered most unsatisfactory here. The separations from the purifiers are less carefully made. Proper scratch systems, as we understand them, are non-existent, the coarse scratch stock being returned to the breaks and the rest dealt with on sizing rolls. The reduction system comprises coarse and fine sizing rolls, second quality rolls similar to our B2 reduction, and tailings rolls that deal with the second and third quality middlings. There are usually six, seven or eight reduction rolls for the rest of the middlings, and the system finishes with low grade rolls for the final finish and the production of low grade flour.

The short roller surfaces used are only feasible because of the type of wheat that is milled and its low moisture content, but a slight variation either in the moisture of the wheat or the humidity of the atmosphere at once leads to trouble. For example, a 1% increase of moisture on the first break might reduce the capacity as much as 20%.

Break differentials are 2½:1, as in England, but reduction differentials are 1½:1, which is rather higher than ours.

The range of dressing cover numbers is limited, for a cover is seldom coarser than No. 10 silk on the head end reduction, or finer than No. 13 silk on the last reduction. In our own mills, we often use a No. 9 silk on the earlier reductions and covers as fine as No. 16 silk at the tail end of the mill.

Flour re-dressing in America is considered essentially part of the milling system, its purpose being to check the work of the flour dressing; the rebolt machines are, therefore, clothed with No. 16 silk and the overtails are returned to the reduction system.

The Wheat Cleaning Department

In the wheat cleaning department, American mills use a good many machines that are well known in this country, such as the Millerator and the Carter disc separator. Some of these were developed largely by the Hart-Carter Co., an American firm which has been very progressive. Apart from these machines and one or two other wheat cleaning machines, there is very little similarity between American and British milling machines. The Americans do have a machine that they call a washer, but it is really no more than a wet scourer—the wheat is not immersed but simply rinsed. If it is very important that stones should be removed, a dry stoner is used. This is frequently to be seen in wheat cleaning plants preparing wheat for the manufacture of semolina. Generally, however, the wheat is very free from stones.

The Roller Mills

In the mill, the roller mills are robust and capable of carrying very heavy loads. They run at an astonishing speed (about 500 r.p.m.) and they make an appalling amount of noise. The diameter of the rolls is normally 9 in., though some mills have rolls with only 7 in. diameter, and others, like our own, have 10 in. rolls. The rolls are mounted side by side, not diagonally, and are driven entirely by belts. At one end of each machine, a jockey pulley is used to enable a single belt from the power shaft to drive the two fast rolls. At the other end, belts drive from the stub shaft to the slow rolls on both sides. The result is that one half of the roller mill cannot be stopped except by stopping both halves. The feed mechanism usually consists of a single feed roll with a screw-adjusted feed-gate. The feed is usually found to be running over only about 80% of the width of the rolls.

Purifiers and Plansifters

Purifiers are always made as single machines with sieve widths between 25 in. and 40 in. They afford less scope for the grading of stocks than do our double machines, with their larger number of narrower sieves. They have no provision for spreading the feed properly across the sieve and, of course, it is practically impossible to get stocks to travel evenly down such wide sieves. A British miller who sees an American purifier at work with its dead patches and turbulence, and stock jumping all over the place, can readily understand why American millers have not much faith in purification.

The plansifters are very big machines with four or six sections and perhaps as many as 27 sieves in each. They have a very high capacity and are efficient in operation. Instead of a rail-guided brush for cleaning the silks they use a piece of canvas, which seems reasonably effective in the dry American conditions. The plansifters contain interchangeable sieves stacked together one above the other and put into an outer box frame. The mechanism is rather crude and the plansifter is anchored to the floor by springs to prevent excessive wandering. Nevertheless, the American plansifter, unlike the purifier, does good work under American conditions. The plansifters are not exhausted as they are here.

Dust collectors in American mills consist usually of cyclones and of the stocking type filter dust collector. They are, of course, very dirty in operation for they need very coarse sleeves on account of the inefficient cleaning method which this type of dust collector has hitherto used. American millers who visit Europe are probably more impressed by the suction filter dust collector than by

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Millers' Camerama

A Picture Report of the 56th Annual Technical Conference of the Association of Operative Millers, Hotel Statler, Buffalo, N.Y., May 18 to 22, 1952

M. F. Tiernan, president of Wallace & Tiernan Co., Inc., Newark, N.J., poses for a picture beside his company's Merchen powered feeder. The company also exhibited a new type of meter for measuring granular material flow.

Philip W. Pillsbury, president of Pillsbury Mills, Inc., Minneapolis, an active member of the AOM, is pictured above with Charles R. Veeck (left) retiring president, and Donald S. Eber (center) executive secretary.

C. C. Carver (left) Commander-Larabee Milling Co., Minneapolis; and E. J. Mayer, Toronto, Ont., pictured at the machinery exposition.

T. Chris Mills, Henry Simon, Ltd., Toronto; F. M. Atkinson, Atkinson Milling Co., Minneapolis; and John Willis, Ogilvie Flour Mills Co., Ltd., Montreal, examine a new type of bin level indicator in the picture on the left. The center picture shows William Bosanko, Standard Milling Co., Buffalo; Frank Smerka, Russell-Miller Milling Co., Buffalo, and T. G. Cecka, International Milling Co., Minneapolis, at the registration desk. In the picture on the right are (left) C. E. Robinson, Colorado Milling & Elevator Co., Denver; and T. R. Edgerton, Merck & Co., Inc., Kansas City.

The Merck & Co. exhibit is the background for a picture showing, from left to right: M. T. Vanderheiden, George Urban Milling Co., Buffalo; E. E. May of the Wolf Co., Chambersburg, Pa.; M. McDermid, Richardson Scale Co., Minneapolis; and C. A. Scott, Merck & Co. representative in Minneapolis.

The Hart-Carter Co. display featured its line of grain-cleaning machines, including the disc separator and cylinder separator. The men seated in the lower left corner of the picture are C. C. Ingraham, Hart-Carter vice president, and J. A. Botterell, Strong-Scott, Ltd., Toronto, Ontario.

Mr. and Mrs. Paul F. Olson, Pillsbury Mills, Inc., Minneapolis, are pictured on the left in the display booth of the Chicago Belting Co., with W. H. Lenker, Minneapolis representative of that company. The center picture is a sneak shot of J. F. Endres, Minneapolis; and J. George Kehr, Buffalo, both employees of the Russell-Miller Milling Co. In the picture on the right, taken at the Superior Separator Co. exhibit, are I. S. Willis of the Superior firm; Fred Haase, Tennant & Hoyt Co., Lake City, Minn.; Gilbert Spaulding, King Midas Flour Mills, Minneapolis; and W. B. Burnet, of the Superior firm.

Millers' Camerama

A Picture Report of the 56th Annual Technical Conference of the Association of Operative Millers, Hotel Statler, Buffalo, N.Y., May 18 to 22, 1952

Pictured above are (left) R. A. Kipp, president of Kipp-Kelly, Ltd., Winnipeg, Manitoba; and J. T. Wimbush, chief engineer for Kipp-Kelly, Ltd.

AOM officers' wives are pictured above before they attended the banquet. The ladies are: (Standing) Mrs. George S. O. Smith (left) and Mrs. Donald S. Eber. Seated are Mrs. C. R. Veeck and Mrs. J. George Kehr.

Shown before the Entoleter display at the exposition are, from left to right: Pearce Wheatstone, T. Chris Mills, Robert B. Dodds, representing the Entoleter firm; and E. M. Evans, General Foods, Inc., Kankakee, Illinois.

Fred Haase (center) Tennant & Hoyt Co., Lake City, Minn., is flanked on either side by two big men from Graton & Knight Co. On the left is Robert Hoal, Minneapolis. On the right is Henry M. Lee, St. Louis. The center picture includes H. K. Swan, grain milling machinery manager for the Allis-Chalmers Mfg. Co.; Stanley Dybevick, milling superintendent, International Milling Co. and C. F. Dawson, A-C representative in Minneapolis. The picture on the right includes Ralph Wolffing (left) and H. W. Myers, National Biscuit Co., Toledo, with W. Dean Sweet, Burrows Equipment Co., Evanston, Ill.

A laboratory model air centrifuge was featured at the Superior Grain Separator booth. The men in the picture on the left are, from left to right: G. V. Kintzle, Robin Hood Flour Mills, Port Colborne; I. S. Willis, Superior representative; and F. LeBere, also of the Robin Hood plant at Port Colborne.

The Day Company, Minneapolis, featured its "Auto-Clean" air filter at the machinery exposition. Shown at the Day firm's booth are (left) Earl Nation, National Biscuit Co., Toledo, Ohio; with Max Springer, Minneapolis, a Day Company sales engineer.

Pinning of carnations on the delegates was done by Helen Argeros (left) and Barbara Mruk (right). The man in the center in the picture on the left is R. M. Finch, Wallace & Tiernan Co., Inc., donors of the flowers. The center picture shows C. E. Huffman, Abilene (Kansas) Flour Mills Co. (left) and D. E. Tobey, Kansas City representative for St. Regis Sales Corp., pictured at the St. Regis booth. In the picture on the right are: Ben Blackburn, Fant Milling Co., Sherman, Texas; John J. Womack, General Mills, Inc., Kansas City, and E. P. Farrell, Kansas State College.

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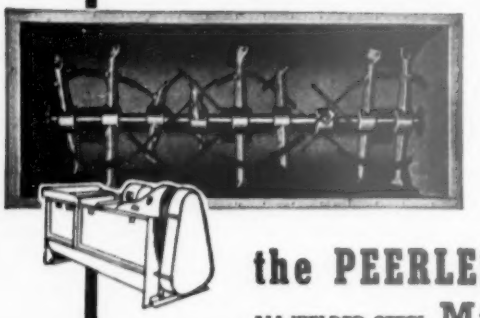

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Technical Changes

(Continued from page 1a)

port, said that the flour milling industry was "lacking" in its industrial training programs. He said that the milling industry "has a long way to go" in bringing it up to the level of other industries in regard to training programs. Mr. Womack said that all new employees should be trained as soon as possible after entering into employment and he had much praise for the AOM correspondence course for classroom work.

He said that his company preferred classroom instruction to correspondence instruction because it was able to reach more prospects and sustain interest over a longer period of time.

He said that a textbook is essential in classroom work to supply direction and purpose and in commenting upon the AOM correspondence text he said that there were several chapters, mainly chapters dealing with physics and mathematics that required more than one section to complete.

Mr. Womack advised that the companies make a small charge for the course, pointing out that the student has a feeling of responsibility if he has some of his own personal funds invested. Pay for the instructors, he said, was not essential and he believed that it would be possible to find a qualified person who would be willing and eager to take over the job of conducting the course. He said that periodic tests are "necessary evils" to measure the progress of the different students. He said that some students will drop out and that is no different from any other instruction course.

It is the policy of his company, Mr. Womack said, to issue a certificate to each student completing each unit and to issue a diploma to the student upon his satisfactory completion of all four units. He also mentioned that it is not too difficult a matter to supplement the textbook material with classroom aids which he said were valuable for demonstration purposes.

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AOM Conference Report . . .

H. K. Swan New Head of Society of Milling Technology

BUFFALO, N.Y. — H. K. Swan, sales manager of the grain and chemical milling section, Allis-Chalmers Mfg. Co., Milwaukee, was elected

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president of the International Society of Milling Technology at the organization's annual meeting held in connection with the technical conference of the Association of Operative Millers May 20.

Other officers named to serve during the year include George L. Smutny, sales engineer for the Entoleter division of the Safety Car Heating and Lighting Co., Inc., Minneapolis, Minn., first vice president, G. E. Huber of the Alexander Belting Co., second vice president, Richard C. Miller of the American Miller, re-elected secretary, and Edward Esher, Screw Conveyor Corp., Hammond, Ind., elected treasurer, replacing Russell Maas.

The executive committee consists of J. H. Waldron, Sprout-Waldron & Co., Inc., Muncy, Pa., Dr. E. G. Bayfield, Manhattan, Kansas, and E. J. Whisler, Barnard and Leas Mfg. Co., Cedar Rapids, Iowa.

The organization passed a resolution providing for a grant of $200 to the department of milling industry at Kansas State College for use in flour milling technology, $200 to that department for its use in the feed milling technology course and $400 to the flour mill engineering division of the University of Minnesota. Dr. J. A. Shellenberger, head of the Kansas State School, and Prof. John M. MacKenzie, in charge of the flour mill engineering curriculum at the University of Minnesota, were present and thanked the organization for its support.

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AOM Conference Report . . .

Radioactive Weevils Used in Study of Flour Contamination

A preliminary report upon the use of radio-active isotopes in a study to determine the distribution of insect material caused by various mill operations was presented by Dr. J. A. Shellenberger, head of the department of milling industry at Kansas State College, Manhattan. Dr. Shellenberger said that the research project had not been completed but described the technique being used. Rice weevils are being used in the study and before being introduced into the wheat to be ground, the insects are fed upon a diet containing radio-active phosphorus.

With the use of a Geiger counter, each of the millstreams will be analyzed for radio-active insect particles during and after the milling process proper, Dr. Shellenberger explained.

He said that the Kansas City office of the Food & Drug Administration was cooperating in the analysis of the results. That agency will analyze samples from the different streams for insect fragment content and an attempt will be made to correlate the radio-activity of each team with its insect fragment count. Dr. Shellenberger explained that a mass measurement rather than a fragment count measurement will be used in the analysis.

The complete report on the research project will be presented in a future issue of the Bulletin of the Association of Operative Millers.

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AOM Conference Report . . .

Sanitation Committee Assembling Material for Manual on Insects

Paul McSpadden, Commander-Larabee Milling Co., a member of the sanitation committee of the Association of Operative Millers, presented a report on that committee's activities during the past year, in the

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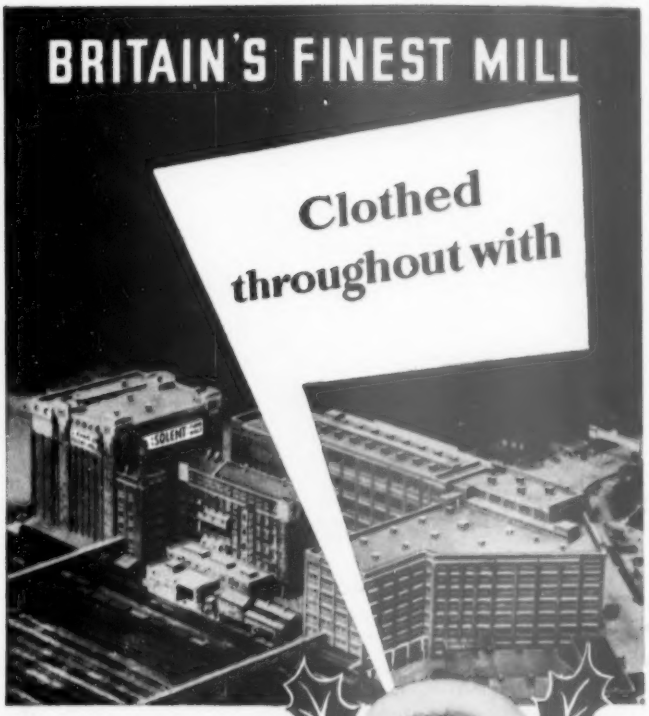

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absence of George B. Wagner, Pillsbury Mills, Inc., Minneapolis. Mr. McSpadden reported to the AOM members that the committee has held two meetings to outline and begin production of a sanitation manual for the flour milling industry.

This manual, like the cereal processor's handbook being compiled by the education committee of the AOM, will bring together all essential material and information and will be a ready reference guide for flour mill sanitarians. Other activities of the sanitation committee, Mr. McSpadden reported, included investigation of possibilities for a central advisory agency on food plant sanitation. He reported that several of the food processing industries have common problems and were cooperating with the recently reactivated Stewart Products Insect Investigation Division of the Bureau of Entomology, U. S. Department of Agriculture.

Preliminary steps have been taken, Mr. McSpadden reported, to establish a curriculum in food sanitation at Kansas State College and at Purdue University. He said that the curriculum in food sanitation would include entomology, microbiology and other subjects which would be combined to supply the food processing industry with trained personnel for supervision of plant sanitation.

v v

AOM Conference Report . . .

Education Committee Reviews Plans for Miller's Handbook

A progress report on the job of compiling a cereal miller's handbook was presented by Prof. E. P. Farrell, department of milling industry, Kansas State College, Manhattan, Kansas, chairman of the education committee of the Association of Operative Millers. Mr. Farrell reported that the first meeting of his committee, held last September, was concerned with setting up an outline for chapter organization for the handbook, and assignments were made to gather in one place all useful data, tables, formulas and other basic information for cereal millers.

At the present time, Mr. Farrell said, the information that a milling superintendent needs in his job is contained in a wide assortment of reference books and catalogs. He said that it was the hope of the committee that all of this information could be combined in one looseleaf book which would be sold at cost to the members of the association. Members of the education committee include W. B. Briggs, Quaker Oats Co., Chicago; Stuart Butler, Maple Leaf Milling Co., Ltd., Toronto; Ray Wentzel, Doughboy Industries, New Richmond, Wis.; Arlin B. Ward, Pillsbury Mills, Inc., Minneapolis; W. J. Wohkittel, Russell-Miller Milling Co., Dallas, and Mr. Farrell.

Mr. Farrell said that it is the present aim and plan of the committee to have the cereal miller's handbook ready for distribution at the 1953 technical conference of the AOM.

v v

AOM Conference Report . . .

Research Committee Cites Need of More Attention to Wheat

Prof. John M. MacKenzie, University of Minnesota, chairman of the research committee of the Association of Operative Millers, said in his annual report presented at the 1952 technical conference of the organization that "it is within the grasp of the milling industry to insist on the development of wheats of better milling quality," adding that the operative miller is regarded as a part of the team of the wheat producer and the cereal chemist. Mr. MacKenzie told the members of a meeting held between plant breeders in the U.S. Department of Agriculture and the research committee. The plant breeders welcomed the suggestion of the operative millers that more attention be paid to the milling quality of wheat. In the past major emphasis has been upon the agronomic characteristics and the baking quality of the new varieties as they are developed by the plant breeders.

The chairman said that research committee activities the past year underwent a period of transition, and the pattern of research committee activities has followed generally the outline set up at the beginning of the year. Major emphasis, he said, has been placed upon obtaining of weight preparatory to milling to take out as much internal infestation as possible, and another activity mentioned was the problem of measurement of the moisture content of the wheat and of the first break roll as well

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NEW CHLORINATOR—A new machine for use with chlorine gas in the flour bleaching operation was introduced at the annual conference of the Association of Operative Millers by Sterwin Chemicals, Inc., New York. Shown in the picture above is N. J. Stromstad, Sterwin representative, explaining the machine to Gardiner Gregg (center) and Joseph Deserio (right), both employees of General Mills, Inc., Buffalo.

as ahead of the tempering operation. He briefly outlined the progress made in those two fields.

v v

AOM Conference Report . . .

AOM Registers Gain in Size, Stature, Secretary Reports

Donald S. Eber, executive secretary of the Association of Operative Millers, in his annual report presented to the membership of the organization said that the association has increased in size as well as in stature within the milling industry during the past year. Mr. Eber cited the formation of the Canadian Prairie District of the association and of the Rocky Mountain District. The Canadian District, he said, was formed largely through the efforts of Ralph W. Bouskill, Purity Flour Mills, Ltd., Winnipeg, and its membership includes superintendents of practically all of the flour mills in the provinces of Manitoba, Saskatchewan and Alberta.

The Rocky Mountain District, he said, includes millers in Colorado and he estimated that it will have about 50 members as a starter.

Mr. Eber presented a gavel to Charles R. Veeck who retired as president of the association as a memento of his year of directing the affairs of the organization. Mr. Veeck's name and tenure of office was engraved upon a silver band on the gavel. In accepting the memento, Mr. Veeck said that he would always cherish it as a reminder of a busy and enjoyable year in his life.

Mr. Eber also reported that the 1952 conference program and membership roster was the largest ever produced by the association. It contained 156 pages.

v v

AOM Conference Report . . .

Industry's Problems a Challenge, AOM President Asserts

Solution of the economic problems facing the milling industry today is a challenge to the operative miller as well as to milling management, in the estimation of Charles R. Veeck, Eagle Roller Mill Co., New Ulm, Minn., president of the Association of Operative Millers.

Mr. Veeck, in his presidential address, cited the results of an economic study prepared by Carroll W. Boyce, National Affairs Editor of "Factory." Mr. Boyce said that if this country wants to continue to increase its standard of living at the same rate it was increased from 1940 to 1950, then the output of goods and services per worker must rise 43% between 1950 and 1960 or more than twice as much as it rose between 1940 and 1950.

Mr. Boyce estimated that there would be a 10% increase in civilian workers or 66 million gainfully employed as opposed to approximately 60 million today. He also said that these facts lead to two national conclusions—first, that there will be a great mass of consumer dollars to be had and secondly, that 43% more goods must be produced by 10% more workers.

Mr. Veeck, in commenting upon Mr. Boyce's conclusion, said that there is "no reason" for the per capita consumption of flour to continue to decline. He said that when bread is properly prepared, it tastes good and that bread is the quick and inexpensive source of energy.

"These facts must be brought to the attention of, and kept before, the American people to reverse an established trend," Mr. Veeck said. He added that "we must study our sales and marketing procedures and adopt a sound and aggressive policy. Our management knows that we cannot continue to give flour away and hope to remain in business. We might also take an introspective glance at organization within our industry and revamp it to meet the coming pressures."

The AOM president said that the answer to the milling industry's problem lies in new technological developments. He referred to an address presented at the 1952 convention of the Millers National Federation by Charles H. Bell, executive vice president of General Mills, Inc.

Mr. Bell said in his address: "It in increasingly important that we encourage our American mill and equipment builders so that they will have genuine incentive to develop new methods and new machinery. We can no longer afford to continue our past philosophy of complacency which leads to outmoded obsolescence. We must modernize."

Mr. Veeck, in commenting upon Mr. Bell's remarks, said that the operative miller "should be happy to hear these words from high places for it is this very thing that we have stressed in our philosophy and thinking for the past six or seven years, and which led to the creation of our research committee." The progress that has been made during those years by the research committee of the Association of Operative Millers was reviewed by the retiring president.

In concluding his address, Mr. Veeck said that looking into the future, it would appear that the miller of tomorrow has kept pace. "Therefore, with the problems ahead, mill management, the miller, the chemist, the machinery manufacturer and the

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trade associations must work hand in hand to meet the challenge that tomorrow will inevitably bring."

v v

AOM Conference Report . . .

Moisture Influence on Flour Yield, Ash Reported to Millers

The influence of milling moisture on flour yield, flour ash, and milling behavior of wheat was reported by E. F. Seeborg, Washington State College. Mr. Seeborg summarized the research work conducted in the Pacific Northwest on varietal development over the past fifteen years. Mr. Seeborg pointed out that the appearance of the variety Rex has stimulated the interest in the investigation of the milling properties of various wheats. Preliminary experimental results indicated that the difficulty in milling the variety Rex lay in the production of a large amount of fluffy white shorts. Further study showed an extreme sensitivity to the amount of moisture added to the wheat before milling. This led to a systematic investigation of the behavior of at least three varieties of wheat, Elmar, Brevor and Rex.

The studies indicated that with increasing amounts of moisture the less desirable wheats from the standpoint of milling quality showed a rapid decrease in both the flour yield and break release with the increase of the moisture content of the wheat going to the mill. At the same time it was necessary to maintain a fairly high moisture content on the wheat ahead of the mill in order to reduce the flour ash to a commercial point. These results have a practical application in the milling of the Pacific Northwest wheats in that those varieties showing a rapid decline in yield with increasing moisture are tempered separately to an optimum moisture value before being placed on the mill.

Research did not stop at this point, however, according to Mr. Seeborg, but was pursued further by the Northern Regional Research Laboratory at Peoria, Ill., and the Western Regional Research Laboratory at Albany, Cal., in order to determine just what properties of the wheat kernel itself produced these characteristics. After preliminary studies of bran thickness which revealed no correlation whatsoever between bran thickness and milling results, the studies were pursued further into the structure of the wheat in the sperm itself. Recently reported results of studies conducted at the Northern Regional Research Laboratory revealed that the cell wall thickness of the endosperm cell has a direct relationship to the milling character of the Pacific Northwest wheats and it is now believed that the fluffy white shorts so troublesome in the milling of Rex wheat can be ascribed directly to the

Gail Louise Preuss

HISTORIAN—Miss Gail Louise Preuss, daughter of Mr. and Mrs. A. G. Preuss, Shawnee (Okla.) Milling Co., recently wrote a term paper on the economic development of the milling industry prior to 1829 as an assignment in one of her courses at the University of Oklahoma. "The real reason for writing the paper was to please my father," Miss Preuss said. "The research certainly had more effect than that. It made me realize what an important role flour milling has played in the growth of the country."

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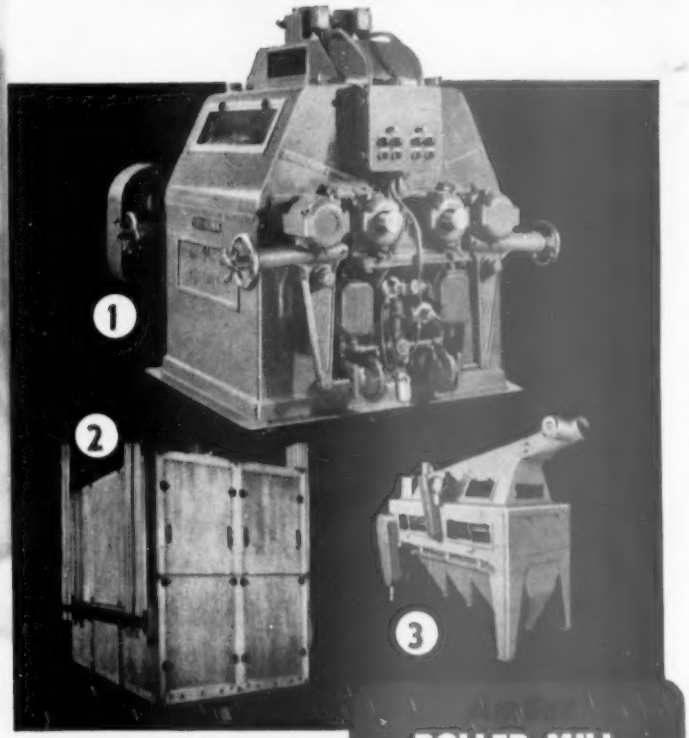

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excessively thick cell walls of the Rex endosperm.

An additional fact that has been established is that the sensitivity of the wheats to milling moisture can be ascribed to the deposition of gummy substances known as hemi-celluloses on the endosperm cell walls. Studies made at the Western Regional Research Laboratory at Albany, Cal., revealed that these substances are found in significantly greater quantities in poor milling wheat such as Rex.

Mr. Seeborg closed his discussion by pointing out that we are just now beginning to obtain a basic understanding of the physical and biochemical properties of the wheat kernel which contribute directly to its desirability as a milling wheat. With this knowledge the plant breeder can now determine very early in his breeding program the factors which will indicate whether or not the particular strain of wheat will be potentially desirable or undesirable for milling purposes. Mr. Seeborg noted, however, that the work needs a great deal more attention and that unless the milling industry and particularly the operative millers show sufficient interest in this type of study it will be greatly retarded. On the other hand, if the milling industry can show sufficient interest, it is now possible for the plant breeders to breed as deliberately for improved milling quality in the future as they now breed for economic results in the field.

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AOM Conference Report . . .

Industrial Relations Problems Discussed by Pillsbury Expert

A discussion of opinions and ideas expressed by a large representative group of millers in a survey made especially for presentation at the 1952 technical conference was presented by A. L. Belcher, director of industrial relations, Pillsbury Mills, Inc., Minneapolis.

The questionnaires which were used as a base of Mr. Belcher's report were mailed to more than 300 members chosen at random from among the membership of the AOM. The replies were analyzed by Dr. S. N. Stevens of Grinnell College, and the summary also was prepared by Dr. Stevens.

The millers were asked to identify the most difficult problem encountered in supervision of personnel. Secondly, they were asked why some millers are not successful or why other millers succeeded where some failed. In commenting upon the results of the survey, Mr. Belcher said that the largest single problem in industrial relations was the problem of reprimanding, disciplining and discharging the employees. He said that more millers indicated that this problem gave them the most difficulty.

Other problems mentioned were in securing and in training personnel. The majority of the millers who answered the questionnaire indicated that disciplinary action was indicated where an employee breaks a rule or does not perform his duties correctly. It was found that in many instances the reason for non-performance of duty was that the employee was not adequately trained for his job.

Mr. Belcher recommended that all employees should be instructed thoroughly in their jobs, that they be told what is expected of them and that an employee should be given adequate reasons for doing his job in any particular way.

Several helpful suggestions were offered by Mr. Belcher in handling this problem of disciplining or reprimanding employees. He said that a person should not be discharged because of some minor infraction of a rule but rather that a warning be given verbally and in private. He stressed the point that it is very inadvisable to call a man down in the presence of others because of the personal embarrassment to the employee. The verbal warning, he said, should be followed up with a written confirmation, and the written notice should be given to the man at the plant and not sent to his home. A carbon copy of the warning, he said, should be filed with the man's employment record. Mr. Belcher also said that a letter is never a substitute for a talk and that the written warning should be only confirmation of the talk.

Mr. Belcher also suggested that if the plant is unionized, the union representative should be notified in advance, and perhaps the shop steward also should be invited to attend a conference with the man who is to be reprimanded or disciplined. He said it is well to remember that there are always two sides to a story and that any supervisor's job was to reduce the number of grievances as well as to attend to the grievances which have been called to his attention.

"It might be very interesting and revealing to you," Mr. Belcher said, "to compare an employer's and employee's conception of the same job." In many instances, he said, the employee's conception of his duties or responsibilities might be found to differ very much from the employer's conception of the same job. Industry training is not as good as it should be, Mr. Belcher pointed out in commenting upon this discrepancy.

The importance of training programs for new employees was emphasized by Mr. Belcher, and he said that employees should learn the job they

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have to do in a step-by-step procedure with explanations for each of the separate steps and added emphasis placed upon the more important steps. An employee can learn more and remember more, Mr. Belcher said, if he can see the purpose of each step.

In summarizing the reasons offered by the millers for the relative success or failure of different supervisors, Mr. Belcher reported that it appeared that the unwillingness to delegate responsibility to others was one of the largest single reasons for failure. Many of the respondents to the questionnaire indicated that their superiors did too much routine work —work that could be assigned to others to leave the supervisor free to really become a supervisor and not another workman. Others made comments such as, "They do too much routine work," "They seem to be afraid to train others in their jobs," "He seems to be afraid that if I learn his job I will take it away from him," and similar comments about supervisors.

The summary of the survey made by Mr. Belcher was quite revealing to the AOM members present for his report, since many of them were participants in the survey.

J. George Kehr, Russell-Miller Milling Co., Buffalo, who presided at the session, complimented Mr. Belcher very highly upon the presentation of the material and said that this is information that all of us can put to good use in our own plants and it also gives us 'a "good look at ourselves."

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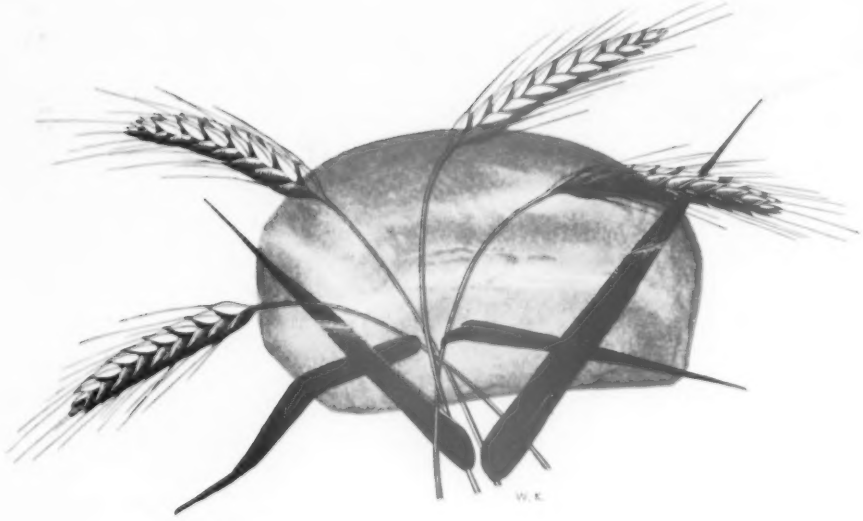

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AOM Conference Report . . .

Chemist Reviews Factors in Flour Quality Evaluation

An explanation of the various chemical and physical factors that go into the evaluating of flour quality was given to the operative millers by George Garnatz, director of the Kroger Food Foundation, Cincinnati, Ohio, in an address entitled, "A Baking Technologist Thinks Aloud."

Mr. Garnatz' explanation consisted of a point by point discussion of the various factors and he said that ash is still used as a basis for trading in flour and therefore it cannot be ignored. Within the mill it serves a useful purpose as an index to control of flour grade, as a check on uniform milling and as a measure of wheat uniformity, Mr. Garnatz said. He added that if the ash test correlates with baking performance, it does so only in a very general way. In its application outside the individual mill, it is alleged, the emphasis placed upon it is not warranted.

The chemist said that, "It is to be hoped that in time some other test for flour grade will be devised that will define flour grade with greater fidelity and acceptable accuracy." Mr. Garnatz suggested that the colorimetric method proposed by Kent-Jones and his associates, "Should be evaluated for its applicability in the American milling picture."

Other factors mentioned by Mr. Garnatz that should be of interest to the operative miller were absorption, the measurement of a malting or gassing power, and flour color.

The role of the wheat breeder was discussed briefly by Mr. Garnatz and he said that since it requires about 15 years to develop a new variety of wheat, the wheat breeder must carry on his work with foresight. "Within that space of time, practices in milling and baking currently in vogue, could well change and become obsolete. The wheats may be called upon after having been milled into flour, to perform over a wide range of conditions. Consequently, in his program, the wheat breeder must be careful not to commit himself too definitely into the future and must refrain from restricting the range in wheat characteristics," the chemist asserted.

In concluding, Mr. Garnatz said, it should be emphasized that his review of flour evaluation was covered primarily with respect to white pan bread produced in large volume, mechanized shops. "Even so, there is room for difference of opinion on details since different bakery operators have different philosophies of operation," he said. "Problems of the smaller operator, the retail baker, and the baker of hard type breads are all so different. Nevertheless, it is hoped that in addition to reviewing the practices applied to testing bread flour for this large sector of the baking industry, an approach to the evaluation of bread flours generally has been sketched which, with modifications, can be applied in the more specialized areas or in accord with individual ideas."

AOM Conference Report . . .

Broken Wheat Salvaged From Screenings Streams

BUFFALO—A method of salvaging cross-broken wheat from screenings streams was described by F. M. Atkinson, Atkinson Milling Co., Minneapolis, at the 1952 technical conference of the Association of Operative Millers.

In his introductory remarks, Mr. Atkinson acknowledged the assistance of H. H. Collier, Atkinson superintendent, and the production staff at the mill and called attention to the fact that he and his associates recognized that there was nothing new about the subject of salvage of cross-broken grain from the seeds taken out in the grain cleaning house. He said he simply wished to present the approach and technique used in the solution of his company's particular problem.

Mr. Atkinson pointed out that the first step was to study the screening streams in the grain cleaning flow to determine the proportions of broken wheat present in the screening streams. Surveys showed that the cracked wheat plus seeds coming from the cylinder separator used for their removal comprised from .6 to 1.1% of the total wheat stream with an average of approximately .8% of the total wheat stream being separated at this point. Of this stream the seeds amount to only 10 to 25% of the stream, or in other words, the amount of clean broken wheat which might be reclaimed from this stream amounted to an average of .7% of the total wheat stream. In this particular mill the total amount of reclaimable wheat was approximately 100 bu. per 24 hours. This figure of course would vary over a period of time due to the condition of the crop, the variations in settings of the machines and the wheat seed conditions prevailing that particular year.

On the basis of this survey, Mr. Atkinson stated that a successful reclaiming operation would be profitable and a study was made to determine the method of reclaiming the cracked wheat. The first trial involved the use of cracking rolls combined with an aspirator, but due to the fact the machinery required continual adjustments of both the rolls and air stream and the relatively low recovery, 30 to 50% of the possible wheat, this device was abandoned. The present installation involves the use of an impact machine with an aspirator which has improved both the quantity and the quality of the reclaimed product. With a proper

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setting of the air flow in the aspirator the present recovery in the new impact system is approximately 70% of the total cracked wheat present in the stream. Of the remaining 30% of the cross-broken wheat which was not recovered, about 18% goes with the seed into the feed. Salvage of any of this 18%, however, on the present equipment does not seem economical at this time, according to Mr. Atkinson.

At the present time the reclaimed wheat flows into the first break sifter without tempering and from there is scalped over to the second break roll. According to Mr. Atkinson, this method allows a slight moisture increase in the other stock and also prevents concentration on one roll. In his particular installation a 30-lb. automatic scale is used to record the amount of cracked wheat recovered. Converting the figures reported by Mr. Atkinson into dollars and cents it appears that approximately $65 @70 a day can be saved in this particular mill which has a daily capacity of approximately 6,000 sacks. This savings is the difference between the value of the cracked wheat milled into flours compared with its value as feed.

* *

AOM Conference Report . . .

Philip W. Pillsbury Sees Bright Future for U.S. Milling

BUFFALO — Philip W. Pillsbury, president of Pillsbury Mills, Inc., Minneapolis, speaking at the 56th annual conference of the Association of Operative Millers in Buffalo May 22, said that the U.S. milling industry faces a bright future.

Mr. Pillsbury only recently returned from a six-week world tour during which time he visited outstanding milling installations in all parts of the world, including Africa, the Near East and Europe.

He pointed out that, in spite of the impressive number of new mills constructed in other parts of the world, the capacity of this new construction has not kept pace with the population growth in those areas. Although the number of mills is impressive, he said, their total capacity falls far short of the total actual and potential demand for wheat flour.

Mr. Pillsbury said that economic conditions in many parts of the world do not permit large groups of the population to consume wheat flour, nevertheless there is increasing world preference for wheat flour. The speaker pointed out, however, that we must bear in mind that in order to rebuild the capacity of the Buffalo mills it would require a capitalization in excess of the entire investment in the milling industry of the entire world if it were reconstructed on the scale of grandeur employed in the small units now being constructed in Europe.

With the present tax picture which probably will prevail for some time, and which is a common problem throughout the world, it is extremely unlikely that we will see any wholesale mill building program in the U.S., he said. With the rapid growth of domestic population combined with both a growing world population and a growing world preference for wheat flour, Mr. Pillsbury sees a bright future for U.S. milling based upon a rehabilitation and modernization of existing plants on a continuous and sound basis of investment. He emphasized that even the famous builders of complete new mills recognize

(Continued on page 16a)

JVLIVS CAESAR

Soldier, statesman, scholar and author, the month of July was named in his honor and the glory of his achievements in Ancient Rome has stretched down through the ages and is familiar to every schoolboy today.

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"What's New" Symposium

(Continued from page 1a)

system suitable for the flour milling industry. Mr. Swan said that, by careful engineering study, it has been demonstrated that older mills can be rehabilitated with a substantial savings in operating costs for the miller if properly engineered.

Reinforced Leather Belts

One of the more recent developments in power transmission by leather belting was briefly discussed by Lloyd Steirly of the S. R. Sikes Co. Mr. Steirly told the story of the inclusion of a synthetic cord between the plies of the belt in order to increase its tensile strength and its resistance to stretching. This new development permits the reduction of a typical belt application from an installation requiring a 12 in. belt to one requiring only a 7-in wide belt and still transmitting the same power with actually less stretching than was obtained with the original plain leather belt.

The chairman closed the "What's New" portion of the program by calling attention to a new grain unloading device called the maniere grain shoveler and the hot-spot detector for picking up and recording grain bin temperatures. These two devices were represented by displays on the exhibit floor and the attention of the membership was called to these two new additions to the milling industry.

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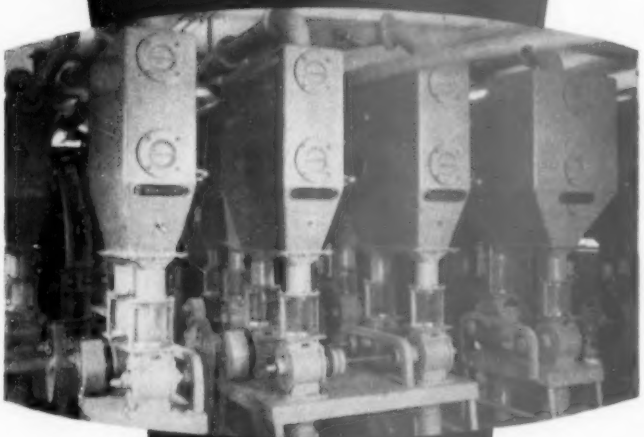

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this factor and have plans and proposals for replacement of individual items of existing milling equipment on the basis of the dollars and cents that can be obtained by the miller through the use of this type of modernization.

* * *

AOM Conference Report . . .

Economic Losses Analyzed in Study of Infested Wheat

The relationship between the amount of internal infestation, the fragment count of the flour milled from the infested wheat, and the economic losses resulting from milling infested wheat was shown in a report presented by Prof. John M. MacKenzie, staff member in charge of the milling engineering curriculum, University of Minnesota.

The search project upon which the report was based was suggested by George B. Wagner, head of the department of economic biology, Pillsbury Mills, Inc., Minneapolis. Much of the work on the project was done by R. K. Durham, Mr. Wagner, R. N. McCaull and Burton Bergquist of Pillsbury Mills, Inc., Minneapolis, and Grant Astleford, Russell-Miller Milling Co., Minneapolis.

Prof. MacKenzie, in his report, emphasized that the data presented represents the minimum amount of evidence and it was requested by Mr. Wagner that the preliminary nature of the conclusions be emphasized with the hope that other members of the association would attempt to supplement this by comparative research within their own organization.

In the first group of tests reported, 25 wheat samples examined by the X-ray technique and the total forms within the wheat kernels were counted in each of the samples. At the same time a count was taken of the total number of weevil-cut kernels appearing on each plate. The remainders of the samples, after removing the amount required for the X-ray plates, were milled into flour and the fragment count per 50-gram sample flour was reported for each of the 25 wheat samples.

These data were correlated and found to have a significant correlation with the number of total forms and also the total number of weevil-cut kernels. His statistical analysis enables us, therefore, to make a prediction of a fair estimate of the number of fragments per 50-gram sample of flour that might be expected in a given sample of wheat having a certain number of hidden forms or

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total number of weevil-cut kernels in an X-ray plate.

The data developed for the particular mill and types of wheats employed should enable each mill to indicate to its grain department the consequences of the purchase of any particular lot of wheat.

The next question that had to be answered was, "What is the effect of internal infestation upon milling results?" In two series of tests run within the past year, a significant correlation has been found between wheats carrying infestation and the screenings loss over and above the amount obtained with the control lot has been detected. In these tests lots of wheat relatively free from infestation were selected and a control sample removed before artificial infestation. The remainder of the lots were then infested artifically and placed in incubation rooms for periods of time varying from three to nine weeks.

Samples were withdrawn at one-week intervals from three to nine weeks and samples cleaned and experimentally milled. The data again led to a prediction of loss due to internal infestation in which it is possible to say that there is an indication that a 20% increase can be expected in the total amount of screenings after a period of nine weeks of incubation similar to the conditions under which the tests were run.

* *

AOM Conference Report . . .

Entomologist Reports on Application of Residual Insecticides

Randall Latta, in charge of Division of Stored Product Insect Investigation, U.S. Bureau of Entomology Plant Quarantine, reported on the factors affecting application of residual sprays. How to spray a wall has been the subject of study at the engineering laboratory at Beltsville, Md., with an effort to evaluate the deposits left upon a wall which has been sprayed with residual insecticides.

The major problem in developing a test of procedure was to perfect a method for recovering the sprayed materials from the test wall. After some period of development the present method comprises a sheet metal panel which is squeegeed to remove the spray. Along the bottom of the panel is a recess trough which catches the squeegeed spray and channels it into a container. In the present test procedure 2,500 mm. of the sample spray is applied by the particular method being tested and the procedure allows for an accounting of 99% of the sprayed material, either as a deposit on the test panel or as a drift or other forms of loss.

According to Mr. Latta, four factors combined to provide the optimum type of spray. These factors are: the momentum of the spray particles which involves both the mass and the velocity of the individual particle; the volume of spray output, the acceleration of gravity, and the velocity of the nozzle itself.

This test method is being used to evaluate commercial sprayers, some of which deposit only 30% of the material sprayed on the wall. Other commercial sprayers are able to effectively deposit 75 to 80% of the total spray released by the sprayer. Tests have indicated that the optimum particle size is approximately 50 microns in diameter and since most sprays produce a range of particle sizes, a 50 micron mass median is recommmended for a given spray distribution.

A distance of approximately two feet from the wall is most desirable for efficient application of the spray.

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A fan type spray was recommended as the most efficient type. A report of the studies will appear shortly in the Journal of Economic Entomology and the Bureau itself intends to make several publications on the studies.

v v

AOM Conference Report . . .

Dust Collector Design, Operation Described

Practical problems and their solutions in the design of dust collectors and dust control systems were discussed by Russell W. Kice of the Kice Metal Products Co. in a paper entitled "Save Our Stock." Mr. Kice presented a series of interesting slides illustrating with humorous cartoons some of the serious defects in existing mill dust control systems. Equally as beneficial and very helpful to the miller were the suggestions presented by Mr. Kice for more efficient design of cyclone dust collectors and dust control duct systems. Following his very brief and interesting paper Mr. Kice called upon his father, Bill Kice, to preside over the question and answer period which provided such a lively discussion that it was necessary to call the morning session to a close. Further questions were referred to Bill Kice for answering after the session.

v v

AOM Conference Report . . .

Principles of X-Ray Use in Infestation Detection Discussed

R. F. Holste, manager of the industrial X-ray section, General Electric Co., Milwaukee, discussed the fundamental principles governing radiography of wheat for the detection of hidden infestation as one of the features of the sanitation symposium presided over by Paul S. McSpadden, Commander-Larabee Milling Co.

As compared with the problems involved in X-raying steel or dense materials, it is necessary to reduce the voltage and hence the frequency of the rays used in penetrating wheat. The lower frequency rays are absorbed in greater amount by the wheat and hence it is possible to show variations in absorption on the presently available X-ray films.

At the present time, between 15,000 to 22,000 volts are employed for wheat. At this low voltage and consequent low frequency or wave length the ordinary glass window of most X-ray tubes would absorb 90% of the rays; hence it was necessary to devise a beryllium window 2 mm. thick which has a sufficiently low absorption to transmit these long wave length X-rays.

Further development was necessary to find a thin plastic to place between the wheat and the X-ray tube and at the present time a .001 inch thick plastic sheet supports the wheat. Just above the wheat is a .002 inch thickness of plastic between the wheat sample and the film.

In order to get the correct uniformity of field it was necessary to get the wheat at the correct focal distance of approximately 28 in.

With the present machine and existing procedures for development of the film it requires from 10 to 12 minutes to complete a sample. With two men, from 20 to 30 samples per hour can be photographed and processed. Without a divider, the present tray will hold approximately 200 grams of wheat spread out so as to present only a single layer of transmission of the rays.

FOREIGN VISITOR—Gaston Baruk (second from left) general manager of Les Moulins de Baruk, Rabat, Morocco, is pictured with three representatives of Buhler Bros., Inc., before the Buhler exhibit at the AOM meeting held recently in Buffalo. The Buhler representatives are, from left to right, Frederick Schless, O. R. Schmalzer, and Hans Weniger. The Buhler exhibit featured a roller mill.

AOM Conference Report . . .

Review of Results With Residual Sprays Presented by Speaker

A review of results pertaining to residual insect sprays was presented by Dr. Walter E. Dove, director, entomological research, U.S. Industrial Chemicals, Inc., in his paper entitled "An Evaluation of Residual Insect Sprays for Mill Insect Control." In brief, Dr. Dove established that the review of research over the past three years indicates that a combination of piperonyl butoxide and natural pyrethrins provides the most effective spray in terms of initial knockdown and eventual kill.

Concentrations of 50 mm. of piperonyl butoxide with 5 mm. of pyrethrins per square foot of surface have been extremely effective. Dr. Dove pointed out that this matter of toxicity to warm-blooded animals is receiving increasing attention on the part of the Food & Drug Administration and it is now necessary to take weaned animals and follow the test through three generations which requires a period of approximately three years before the insecticide can be declared safe for use where warm-blooded animals may consume significant quantities of the insecticides.

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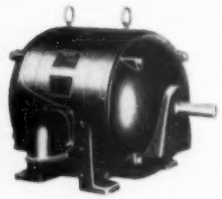

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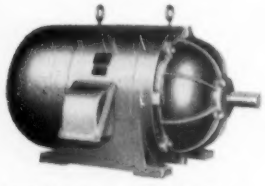

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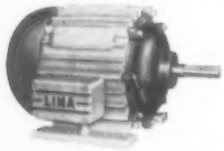

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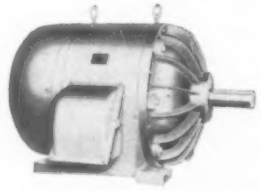

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Feed Technology Training

By Loren V. Burns

THE tremendous expansion and development of the formula feed industry in recent years has accentuated the need for personnel specifically trained for duties in this field. New developments in formula feed production, such as the use of micronutrients, concentrated growth promoters and powerful drugs, have brought increasingly complex operations which require trained personnel, skilled supervision and resourceful application of knowledge from many different fields, ranging from animal disease to equipment design.

Added to this is the decided trend toward college education and the use of college graduates in business and industry—a trend which arose in part from the increased use of technical personnel, but which is now evidenced not only in technical fields but in management, sales and many other phases of industrial operations.

EDITOR'S NOTE: Loren V. Burns, the author of the accompanying article, heads the feed technology training program which has been established at Kansas State College, Manhattan, through the joint efforts of the feed industry and the college. In this article, Mr. Burns outlines the program being offered at Kansas State, explaining the specialized training available. He also notes that the special building and pilot feed mill to be erected will provide facilities for the study of feed manufacturing problems. This article is the text of a talk presented by Mr. Burns at the recent Kentucky Animal Nutrition Conference.

The training required for formula feed manufacture transcends many of the established fields of instruction; as a result the individual who wished to specialize in some phase of feed technology had no place where he could obtain concentrated, authoritative training in the field of his interest.

For example, a business administration course is excellent training for management duties, but management personnel in the feed industry must also have a thorough working knowledge of formula feed operations which can be gained at present only through costly and time consuming experience. Likewise, a nutritionist with formal training but without commercial experience must go through a year or more of indoctrination and training in commercial operations before his knowledge can be put to full practical usage. Similarly, many companies have hired young engineering graduates to train for responsible positions in plant operations, but these engineers seldom have the background in biological science and animal husbandry necessary to grasp the influence of mechanical operations upon the acceptability and biological quality of their products.

Personnel currently available to the feed industry must undergo an extensive period of training to develop background and experience in many phases of feed operations for which their college training has not equipped them. Even with this auxiliary training, they often do not acquire the fundamental knowledge necessary for a thorough grasp of the complex problems encountered in feed manufacturing today.

As a result of these diverse requirements, coupled with the need for qualified personnel in an expanding industry, a college course in feed technology was initiated through the joint efforts of the feed milling industry and Kansas State College. It will be the endeavor of this training program to develop individuals with the diversified knowledge necessary in modern formula feed operations, thus enabling their employer to by-pass much of the long and costly period of training and experience through which individuals are currently prepared for responsible positions in the feed industry.

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by the industry because its present curriculum in flour milling provided a staff and administration already experienced in handling many of the problems which would be encountered in establishing a feed technology program, because its experienced teaching staff and established courses in allied fields could provide qualified instruction in vital subjects without unnecessary duplication of staff personnel, and because the milling facilities, biological laboratories, and farm operations of the college provided the auxiliary facilities essential for effective operation of the program.

Through generous contributions from many feed manufacturers, a special building, including a pilot feed mill and associated units, will be erected during the next year to provide facilities for training, investigation and research in feed technology.

It is the objective of the current program in feed technology to provide training and limited practical experience in the processes of formula feed manufacture, but primarily to thoroughly instruct the student in the multitude of subjects fundamental to formula feed operations and teach him to integrate this subject matter into commercial operations.

Basic Courses

During the first two years most of the student's time will be devoted to basic courses in science, engineering, animal and poultry husbandry and general college subjects. These courses provide the fundamental technical training essential for a thorough understanding of milling processes and formula feed operations, develop a basic knowledge of animal and poultry production, and through general training endeavor to develop the ability of the student to express himself in written and oral communications and to serve his community more effectively.

Concurrently, the student is given direct instruction in feed technology. He is first introduced to the industry through a course entitled "Elements of Feed Manufacture," in which the organization operations and functions of a feed manufacturing enterprise are studied and the basic principles of feed manufacturing developed. Next, he receives an integrated picture of feed plant processes through the study and preparation of flow sheets.

Specialized Training

As the student progresses, he receives more detailed instruction in various phases of feed technology, but because of the complexity of modern formula feed operations it is necessary that he pursue work in more specialized subjects and thus must restrict this phase of his training to a field of specific interest. Currently the student may select one of three fields of major interest for his specialized training: Administration, operations or nutrition.

The option in administration is designed for students who wish to emphasize the business aspects of feed manufacturing and expect to enter management, purchasing, sales or similar functions. Training in basic subjects and fundamental feed technology is combined with studies in business and economics to provide a well-balanced background for ultimate management or administrative duties.

The option in operations is designed to train the student for plant operation, engineering or design. Basic courses in mechanical and electrical engineering are combined with comprehensive studies in feed manufacturing processes, equipment installation, operation and maintenance, plant design and construction, and similar subjects. This training, when augmented by experience and maturity, prepares the student for responsible jobs in the operating or engineering departments of feed mills, with engineering or construction firms specializing in feed mills, or with manufacturers of feed mill equipment and machinery.

The option in nutrition is provided for students who desire training in feed technology with stress on the nutritional aspects. Such training will equip the student for duties in commercial formulation, laboratory operations, consumer education programs, field service organizations or other aspects of the industry where nutritional knowledge is a predominant requirement. The limited specialized nutritional training possible in a four-year course cannot supplant the need for advanced training to those who wish to become fully qualified feed nutritionists, but this option does provide an excellent foundation for many duties in formula feed operations.

Each of these options is offered to train personnel for a specific need. This training, coupled with proper utilization of the graduate's knowledge and ability, will enable him to perform more capably and advance more rapidly to jobs of responsibility. His basic knowledge, and better grasp of the fundamentals underlying formula feed problems, will enable him to attack and solve these problems in a direct and expeditious manner, thus avoiding many of the mistakes made by untrained personnel.

The pilot feed mill, a small scale plant capable of duplicating commercial operations, will serve a vital

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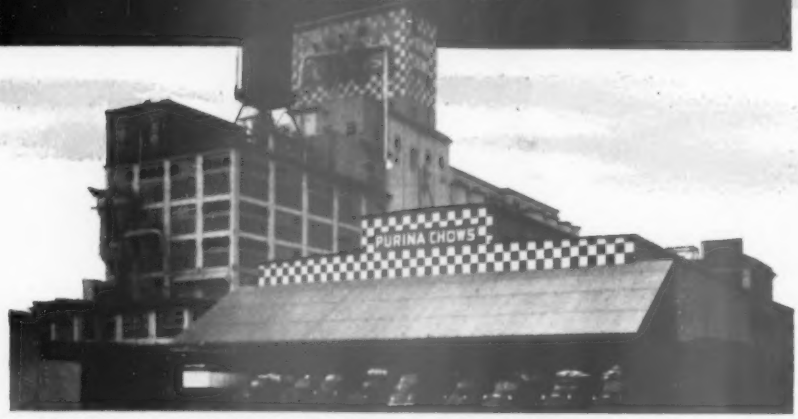

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function in the student training program to familiarize the student with equipment and operating techniques utilized in commercial feed milling processes.

However, this pilot mill has an additional application which can prove of inestimable value to the feed industry if properly utilized. To our knowledge this will be the only unit of its type in the world—no such completely integrated facilities for the study of feed manufacturing problems will be available anywhere. Coupled with the associated laboratories, biological facilities and experimental farm operations of Kansas State College, the feed industry is provided with an incomparable unit for the investigation of all phases of feed manufacturing.

The small capacity and correspondingly low operating cost of this pilot mill, coupled with its great flexibility and complete freedom from commercial production commitments, permit the study of a process over a range of conditions which would be totally impracticable to study with commercial plant facilities. Thus, this pilot mill is ideally adapted to the investigation of existing feed manufacturing processes, to the development of new processes and to research studies. It should also prove extremely valuable in the preparation of commercial type formula feeds for nutritional research, duplicating physical characteristics and processing conditions so that the results of nutritional tests will be directly applicable to commercial operations.

The processes and manufacturing techniques of the feed industry have not kept pace with the rapid expansion and development of other phases. In the field of nutrition, research has made significant contributions to the advance of feed technology and has brought about the widespread utilization of micronutrients, and drugs in formula feeds. But these very changes have created perplexing manufacturing problems. For example, right now the problem of uniformly dispersing certain drugs in feed is of serious concern to those firms which maintain adequate control over their product.

To keep pace with these trends the processes and production techniques of the feed manufacturer will have to be improved through an organized program of investigation, development and research. Such a program cannot be undertaken without the wholehearted support of industry through projects, grants or fellowships which supply the necessary funds for materials and personnel to carry out these studies. Whether individual, company, group or trade association, these projects will not only assist in the solution of individual problems, but will make a major contribution to the progress of the formula feed industry, as well as assist in the advanced training of personnel for industry.

—BREAD IS THE STAFF OF LIFE—

FEED MILL FIRE

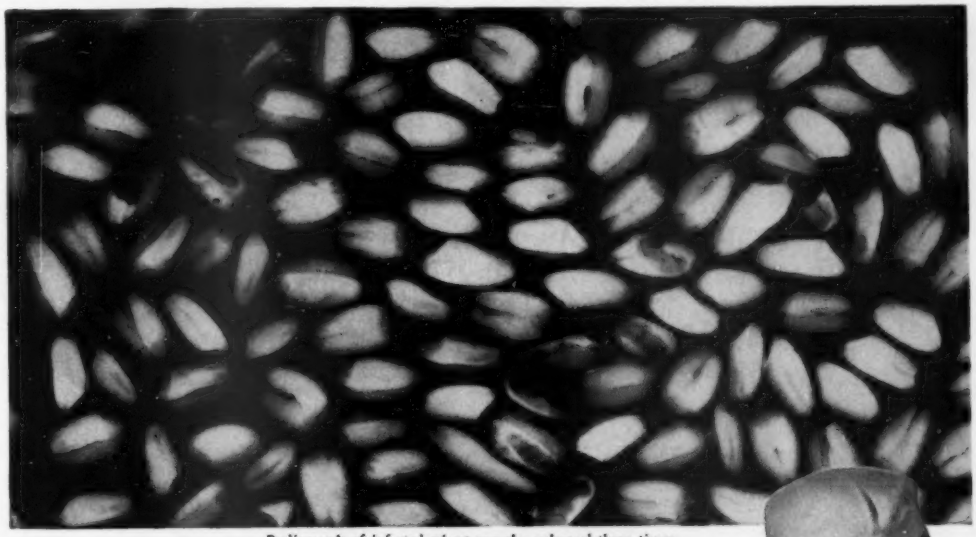
MEMPHIS — Fire recently swept the Emco Feed Mills in Earle, Ark., near Memphis, destroying the plant's loading equipment and damaging three grain elevators in which corn was stored. Damage was estimated by company officials at $150,000.

PAPER SACKS
FOR MILLERS
The Chatfield & Woods Sack Co.
CINCINNATI, O.

The Grinding and Sifting of Flour in Ancient Times

NAUM JASNY, a European scholar who delves deeply into flour milling history for a Belgian scientific publication called "Osiris," comes up with a fellow historian's conclusion that the ancient Egyptians employed the gradual reduction system of milling. He cites the interpretation of Pierre Montet of a scene on the tomb of Ti, who was of a dynasty that came to its end around 2500 B.C., which implies that the 17 or 18 saddle-stone mills shown on the relief may have formed one system and that hence the repeated-grinding method may be perhaps 5000 years old. Furthermore, a German writer, B. Lansburger, after having copied from a lexicon a description of a mill operating on the principles of high grinding, suggested that the same process may have been practiced in Babylonia before 2000 B.C.

Although he is willing to entertain seriously the conclusions of his fellow scientists, Mr. Jasny himself has found no indications that grain was ever ground more than once in antiquity. "A second passage through the grinding mill," he says, "is not indicated even for 'soleth,' the material from which the sacrifice bread of the Jews was prepared, the best ground product of antiquity known to us. All diverging interpretations, specifically of the Egyptian reliefs, are merely a transference of today's practices to the past. Only the removal of the hull by pounding in the mortar ever occurred in a special operation; according to Greek



Radiograph of infested wheat sample, enlarged three times.

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GENERAL ELECTRIC

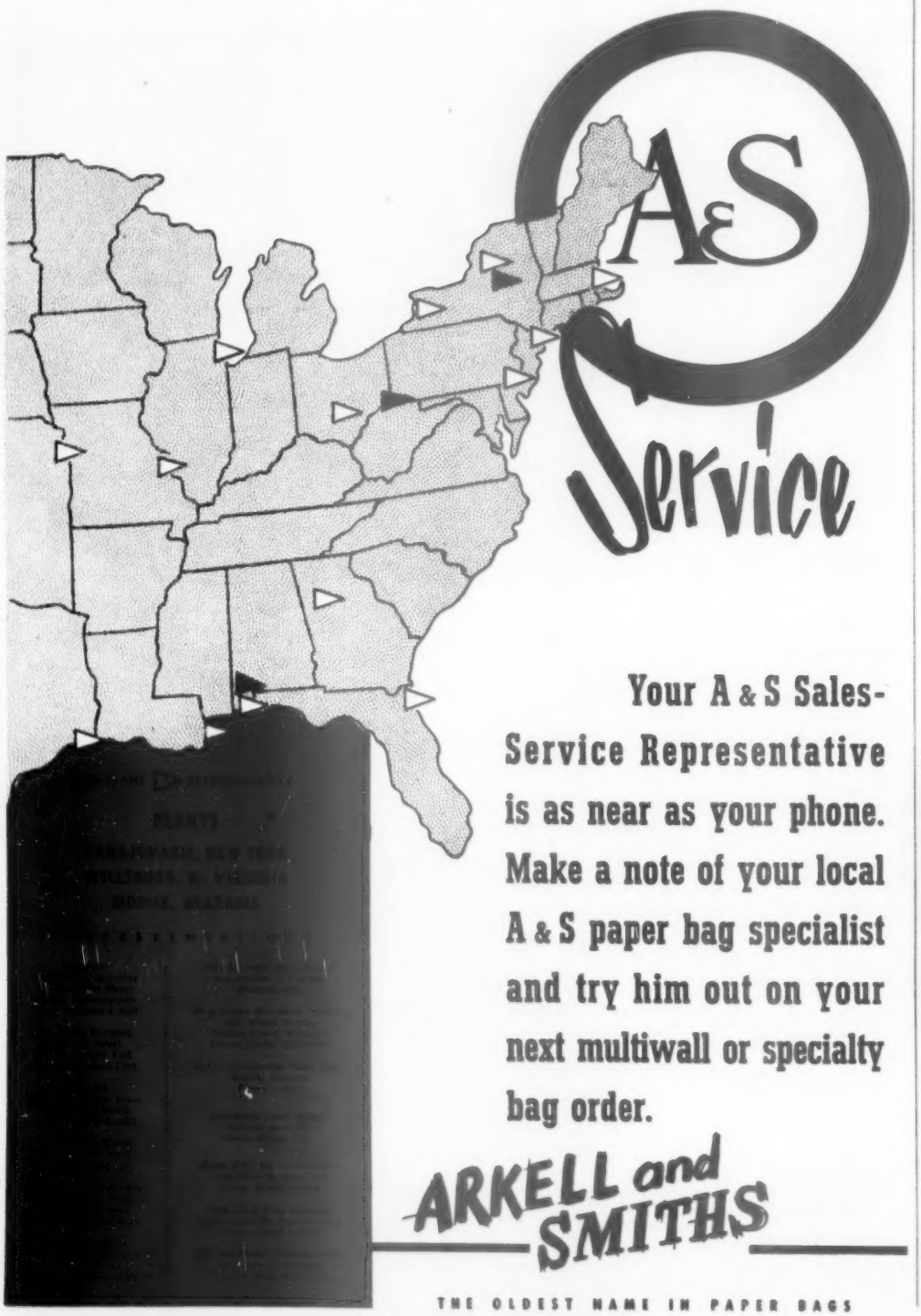
sources, the pounding was even repeated, if necessary."

The Rotating Mill

In the 2nd century B.C., possibly even before, the earlier groping led to one of the greatest discoveries of the human race, the rotating mill. The mill was available in two forms, the so-called "Roman" or donkey mill, i.e., a mill rotated by a man (or men) or an animal moving around the mill, and the quern, a hand mill, rotated by an unmoving person or persons. Although in the literature the emphasis is always placed on the "Roman" mill, the quern was probably the more important of the two types at that time. Sometime around the beginning of the Christian era, the rotating mills operated by men and animals were joined by the mill turned by water, but the water mill, probably the most imperfect of them all, spread very slowly and did not become important before the Middle Ages.

"The rotating mill," writes Mr. Jasny, "did not come into the world perfect, like Aphrodite from out of the sea's foam. The development of the quern in the Mediterranean region has never been fully investigated, but E. C. Curwen did a thorough job for Britain. He found that a reasonable degree of perfection was not reached by the quern until about the 4th century of the Christian era. Such a relatively simple implement or machine as the quern thus needed more than half a millennium, perhaps almost a whole millennium, to pass from infancy to relative maturity.

"August Mau reported that one of the Roman mills excavated in Pompeii had been reconstructed and 'grinded very well.' He probably should have said that 'it turned.' The



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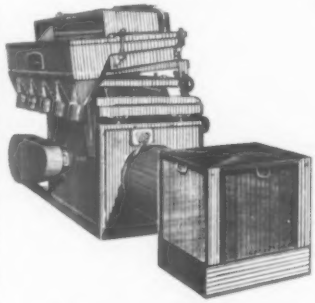

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ANALYSES
FLOUR FEED WHEAT
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so-called Roman mill could not work even fairly well. The absence of a gear, as well as other defects in it, excluded anything like adequate functioning. The animals or men had to move in a very small circle, of a diameter of less than three yards. To prevent the animal from becoming groggy it was blindfolded; but, even so, it could not develop the power it would have developed under more favorable working conditions. Furthermore, although the animal was almost touching the mill, the mill was unlikely to have rotated at more than 1.25 miles per hour at the periphery, and this is 15 to 20 times less than the optimal speed. A stone mill, properly grooved and rotated at the proper speed, is supposed to cut rather than to rub. The slow-moving Roman mill could only rub; the effect was a poor product and enhanced power expenditure.

The Product Was Coarse

"The grinding in the Roman mill inevitably had to be coarse not only because of the large power outlay but also because, with the clumsy form of the mill and improper application of power, it must have been very difficult, even impossible, to keep the grinding surfaces of the stones in contact at all times. In the spots, through which most of the ground product naturally passed, the distance between the stones was certainly large. The degree of fineness attainable in the Roman mill was indeed probably smaller than in the saddle-mill, although in practice the product of the Roman mill might usually have been somewhat finer, because of the diminished cost of power per unit of ground product.

"So far as rotating mills are concerned, the gear was apparently first applied to water mills, although the very first water mills may have been made without one. The famous water mills described by Vitruvius (2nd half of the last century B.C.) was in any case described as having been equipped with a gear. Technology, however, was to such an extent in its infancy that the availability of the gear was not taken advantage of for increasing the speed of the mill. Indeed, Vitruvius' text implies that the mill proper turned even more slowly than the main shaft, about as slow as the Roman mill.

"Grinding experiments with the Roman mill (the Vitruvius or any other classical water mill was never reconstructed successfully) have apparently never been made. As to the quern, 'it employs two pairs of hands four hours to grind only a single bushel of corn,' reported Dr. Johnson from Scotland in the 18th century. An Indian woman is supposed to be able to grind 4 lb. of grain per hour with a hand mill. Coarse grinding was, or is, involved in both cases. Curwen arranged experiments with querns that dated from the 2nd to the 4th century of the Christian era, and fairly good and probably reasonably fine flour was obtained by the repeated-grinding process.

The Sieves of Antiquity

"Fine sieves like those used today for sifting flour would be out of line with the grinding machines of antiquity. Classical sources, mainly Pliny, indicate that the finest sieves of that time had meshes comparable with those employed now in the production of farina. It is significant that soleth, the best ground product of antiquity, probably was not a fine flour, but was comparable, in size of the bits, with the present farina.

"While repeated grinding is not indicated by the sources, more than one sifting after the one grinding was practiced to a certain extent: for example, in the three-grade grindings and in the preparation of the best alica—both as described by Pliny. As many as 11 to 13 siftings of a product ground only once were involved in the production of soleth.

"All statements of classical authors pointing to fineness of a certain flour, therefore, have to be taken only in a relative sense. The use of the adjective 'fine,' where it is not found in the original, is clearly wrong. Coarse grinding is not a very serious evil, however, in itself. Clean grain, coarsely ground, with all the hull (if the grain is a hulled one) and at least part of the skin removed by sifting, yields, when properly baked, a bread that has a good taste and is palatable, although necessarily coarse.

"In antiquity, most of the grain was apparently ground together with all the foreign matter and dirt in and on it. Pliny, who described the most refined grain-processing known in Europe at his time, had nothing to say on the cleaning of the grain before grinding. In the Near East some of the wheat, the choice grain, was washed—a thorough method of cleaning. Hand picking of foreign matter, probably mainly larger stones, also is indicated by the sources only for the Near East (the Mishnah) but was probably practiced also in other areas. More frequent than those operations was possibly the use of one or two sieves for removing the foreign matter larger and smaller than the grain proper.

"In Egypt the use of a sieve for this purpose is indicated by the re-

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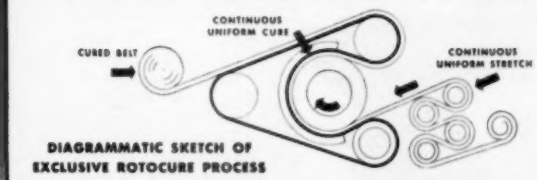

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X-RAY MACHINE—The newly developed machine for making X-ray radiographs of grain, exhibited by the X-Ray Department of the General Electric Co., was one of several pieces of equipment which attracted more than usual attention. Shown in the picture above at the General Electric booth at the annual conference of the Association of Operative Millers are (left) Dewey Robbins, general milling superintendent, Fisher Flouring Mills Co., Seattle, and R. M. Landis, a General Electric representative.

liefs even for pre-classical times, but the practice is unlikely to have been common. The worn state of the teeth of the mummies is commonly explained by the presence of a great deal of sand in their bread, and it seems unlikely that this sand came solely from the grinding stones. Even for classical times the practice of cleaning the grain with a sieve is mentioned by Egyptian sources only, or mainly, in cases when repayment of a debt in grain was involved, i.e., when there was reason to be afraid that the grain would be purposely in poor condition."

——BREAD IS THE STAFF OF LIFE——

Feed Mill Capacity

Feed mills with a capacity of one to two tons per hour are the ones customarily found at country point grain elevators. They are operated by one to three men who often have other duties to perform. Milling operations are in most instances intermittent and seasonal.

The regular feed manufacturing plants of the batch type with a capacity of 10 to 18 tons per hour require from 15 to 30 employees. Line mix plants with one production line unit operating at 20 to 30 tons per hour required 20 to 40 people. The employees for the large plants include the mill superintendent, foreman and workers for receiving, milling, warehousing and loading feed on trucks and cars. A crew member for small plants acts as foreman.

Lacey F. Rickey in his study of the cost of manufacturing feeds states in effect, that labor costs account for about two thirds of the total expenses in manufacturing feed. In his study covering 26 mills manufacturing expenses ranged from about $3 to over $13 a ton, with approximately three fourths of the mills within a $3.50 to $8 range. He makes the following pertinent comments of interest to engineers in reference to milling costs: "Factors causing expenses to be high appear to be poor, outmoded plant arrangement and equipment, and operating far below plant capacity. One mill, however, was being pushed so hard to meet demand that efficiency was reduced.

"It would not be fair to ascribe high costs to poor management although that undoubtedly is a factor in some cases. In many of the plants having high costs, equipment, arrangement and other factors are such that the best of management could not make a favorable record.

"Several of the mills are located in old buildings originally erected for other purposes. Even with extensive structural changes managers often have found it difficult to obtain proper arrangement of equipment and flow of production through the plant. Some of the plants, although comparatively new, appear to have been built without the advice of engineers fully abreast of recent developments in feed mill construction. Consequently these plants were out of date when they started operations and cannot be expected to operate efficiently."

The important items affecting labor efficiency in feed mill design includes synchronized equipment, flexible operations, and convenient arrangement of facilities for maximum utilization of the workers' time and energy in productive work.

American Mills

(Continued from page 3a)

any other machine they see in our mills.

Specification Flour

A special condition of the American milling industry is that millers have trained the bakers to specify their requirements. This has resulted from keen selling competition; salesmen have offered to guarantee that flour would be supplied to the bakers with a certain ash content, a certain moisture content, and so on.

The miller simply has to produce the flour that the baker specifies, and he will do so in general by removing more or less of the low grade flour—2%, 5%, or even more—until the remaining salesman, therefore, competes with another in offering flour of lower and lower ash content. Even though such excellent wheats are used, the extraction obtained overall (including the low grade flour called "clears") seldom exceeds 72%, with an overall ash content of about .46% on a wet basis.

The proportion of mills with labor

atories is larger in America than in England, and their mill laboratories in general are better equipped than our own. One of the reasons for this is the practice of selling flour to guaranteed specifications in respect of moisture, protein, ash, and other qualities, all of them subject to checking by the purchaser. Mill control baking tests are also performed quite regularly, and other tests are made for acidity (pH), gas production, gluten, color, and viscosity. Brabender equipment has also found its way into a good many mill laboratories.

Sanitation

The cereal chemists have discovered what is known as "the filth test"; it is determined fairly easily in any particular sample of flour how many fragments of rodent hair, insects and the like the flour contains. Although all the authorities agree that the presence of such fragments in flour is not a danger to the public health, they regard it as an indication of insanitary manufacturing conditions. The authorities in America are now particularly severe and are liable to close down a flour mill if they find that after due warning the flour still contains a high count of insect fragments. Mill insects breed much more freely in the American climate than they do in ours, and the conditions under which the American mills work, with hot stocks and poor exhaust, have also encouraged mill pests. The authorities have been so strict and have given such strong warnings for the future that the industry has been almost in a panic to discover how they can prevent pests from breeding in the flour mill.

As you probably know, there is an American invention called the Entoleter centrifugal machine, through which flour can be passed continually. It destroys all insect life and eggs, so that the flour may be kept indefinitely without risk of insects breeding; but the Entoleter does not remove the dead insects from the flour and though treatment by such machines may satisfy the miller and the customer, in that the flour can be kept for long periods on a grocer's shelf without deterioration, the authorities are still liable to find in their filth tests that the flour contains insect fragments.

Millers have spent literally millions of dollars in the last year or two on painting their mills, eliminating cracks in mill floors, concreting roller mill hoppers, and so on, to take away ledges where insects might breed. This drive has also led to the condemnation of the worm conveyor and everyone is searching to find another means of conveying which will not allow stagnant stock to lie at the bottom of the conveyor. For this reason, the centrifugal machine has been condemned completely and plansifters are the standard sifting machines in their mills. Purifier worm conveyors are being eliminated and are being replaced by simple hoppers. The need for sanitary mill machines has, of course, brought about the introduction of many new machines. At the same time high wheat prices have made it more profitable to have longer extraction, especially to make a longer extraction of patent flour. With a view to obtaining better milling results, and flour free from insect fragments, a committee of the Association of Operative Millers was formed to advise on the subject of machinery design. Its terms of reference allude to statements by American millers who have said that no improvements in milling have been made in America during the past 50 years. In their deliberations, they have visualized the milling machines of the future with three main objectives in mind:

(1) Infestation. (2) Appearance. (3) Efficiency.

Note carefully that efficiency ranks as the third of their objectives, while infestation is the first.

Here, briefly, are some of the suggestions this committee has made. You will, of course, realize that many of these points recommended by the committee have been included for many years in machines of English design.

Roller Mills

(a) Each half roller mill should have an independent feed mechanism, with an independent drive.

(b) The feed should be uniformly distributed along the full length of the rolls.

(c) Roll feed gates should work automatically.

(d) The countershaft for carrying a jockey pulley should be eliminated.

(e) The rolls should be easily removable from the roll stands.

(f) The roll adjustment should have a separate roll thrown-out for each half roller mill; it should also have a micrometer adjustment and an improved method of tramming.

(g) The roller mill should contain an improved method of exhaust for adequate cooling of the rolls.

Plansifters

(a) Provision should be made for the elimination of sweating.

(b) A better cleaner should be provided than the piece of canvas used for the purpose at present.

(c) Plansifters should dispense with the springs or other devices that now anchor them to the floor.

Purifiers

(a) The present type of feeder is entirely unsatisfactory. A new feeder should provide a uniform distribution of stock over the full width of the purifier.

(b) The purifier gate should automatically adjust itself to fluctuations in load.

(c) The mechanism for adjusting

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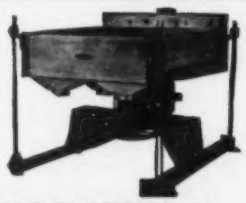

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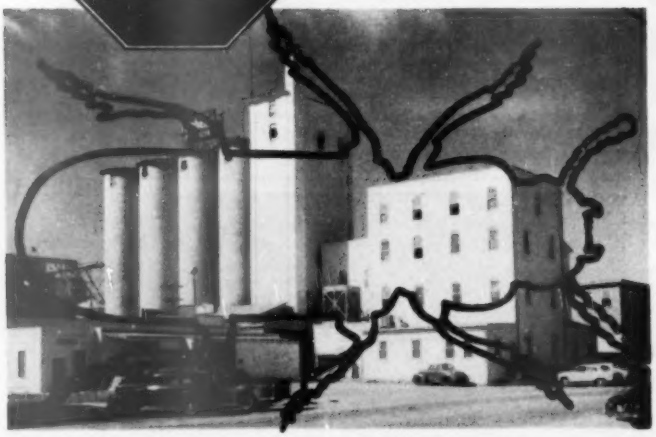

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the sieve pitch and throw should be improved.

(d) There should be a better means of cleaning the silk covers.

(e) The mechanism for vibrating the sieve should be improved.

Dust Collectors

Dust collectors at present used in the milling industry are not efficient and should be improved.

American milling engineers have been working hard to try to give effect to these recommendations. The two principal firms of milling engineers have both produced roller mills which use gears or chains for the differential roll speeds. Both of these have long been used in this country and were previously condemned by many American engineers. In my opinion, the new roller mills are still very crude, but it is claimed that the elimination of the big, flat belts has saved a lot of power, and that the better feeding mechanism, by spreading the feed along the full length of the roll, can save 15 to 20% of roll surface which American rolls have hitherto wasted.

There is a considerable drive at present to increase the popularity of wheat washing. Very few American millers wash their wheat but those who do have made much of the fact in their advertisements. Several articles, advocating wheat washing, have appeared in American milling journals in recent times. The Americans have obviously less to gain from washing wheat than we have for, as I have already mentioned, their wheats are cleaner and contain fewer stones. Nevertheless, they find that washing does yield real advantages; for instance, washed wheat can be more uniformly tempered and makes a more regular flour, with a more uniform moisture content, less ash, and a better color.

The Buildings

The mill buildings usually have concrete floors and the spouting consists of tubes made of sheet metal.

It is usual to return the hot air exhausted from the machines back into the mill building. This is partly due to the extremely cold winters, but many American millers have come to believe that the returning of the damp air back into the mill is good for milling conditions. Nevertheless, climatic conditions compel the American miller to give more thought to control of the temperature in the mill than is needed in England. Many millers have radiators for winter use and in some cases the air is passed through a furnace. Many mills possess humidifying plants.

Superior Packing and Handling Methods

I have dwelt almost solely on the mill side, which I really did consider to be old-fashioned and cumbersome, but—and this must be a big but—they are giving surprising results and maintaining colossal outputs, but on leaving any mill, and coming to the packing and handling, the methods and results are far ahead of anything in this country. I would describe them as "straight line systems," i.e., the shortest distance between two points, viz., the flour worm and the delivery vehicles. In many instances, warehousing is eliminated entirely, and products pass straight from automatic weighers on traveling bands into railway trucks.

One of the first mills I saw had a most efficient bulk flour storage plant capable of holding eight days' output. Packing was done during the day on high speed packers direct to either road vehicle or road trucks. Another mill, a most incredible place, ran all flour into bulk bins, and blew the offal direct into bulk railway vans, thus reducing packing and handling to an extremely low manpower cost.

In direct contrast to the mill, the packing and handling had been constantly altered, and much money spent on new equipment and very latest ideas, and although I have no figures to quote, I would have no hesitation in assuming that this particular mill was producing flour at a lower over-all cost than any other not only in America but possibly further afield.

I said earlier that American milling was considered backward—such comparison can only be against, say, our own or Continental milling—but I would not for one moment even suggest that American millers are in the least degree backward in making flour and achieving results, and in this direction one must hand it to them for doing a job possibly entirely different from ourselves but as best suits all conditions as far as they are concerned.

If I had not been pre-warned I should have expected to find the flour mills fitted up with ultramodern plant, gaudily decorated and having every conceivable gadget, but here I must conclude and leave the paradox to the future.

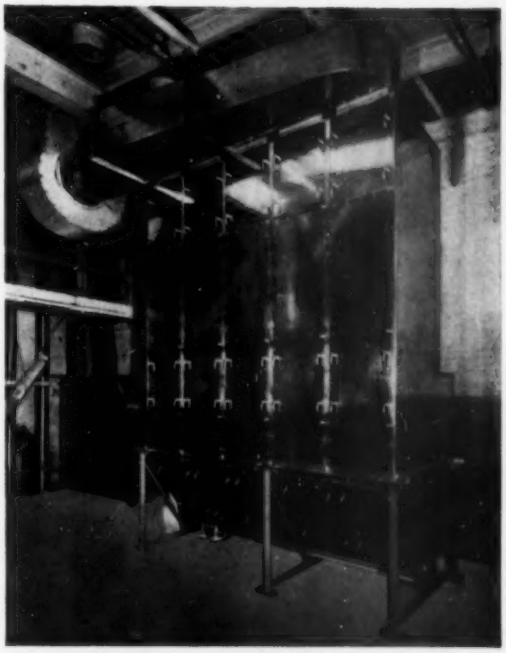
ALLIS-CHALMERS EXHIBIT—Prominently displayed at the machinery exposition held in connection with the 56th annual meeting of the Association of Operative Millers was an all-metal low-head gyratory sifter manufactured by Allis-Chalmers Mfg. Co. The men in the picture, taken at the A-C booth at the exposition, are W. L. Campbell, Pioneer Flour Mills, San Antonio, Texas; and Henry Stark, A-C sales engineer, Oklahoma City, Okla.

$ave $ out of DU$T

Your mill benefits from the most improved dust control equipment when you have the Simon Suction Filter Dust Collector.

Dust laden air that escapes to the atmosphere is both a nuisance and a waste of valuable stock. This mill problem is effectively solved with the Simon Suction Filter Dust Collector. Self-contained, all-metal, this unit needs no accessory equipment except a fan and connecting ducts. Dust is collected at practically 100% efficiency, permitting air to be blown out of the flour mill without costly loss of stock, or into the building without risk of dusty atmosphere.

ADDED ADVANTAGES: Cleaned air from collector can be returned to mill to save heat in winter, and blown outside in summer to control humidity • Stops the dust nuisance • Proven by years of experience throughout the world • Streamlined ALL METAL design with minimum ledges and dead spots • Minimum maintenance cost • Low power — 1-HP to operate 12-section unit • Operates under suction, eliminating dust leaks.



The Simon Suction Filter Dust Collector
U. S. Design and Manufacture by
ENTOLETER DIVISION

Write to us for complete information on "ENTOLETER" Centrifugal Machines and the Simon Suction Filter Dust Collector. We will be glad to make recommendations to meet sanitation and dust control problems encountered in mill operation. ENTOLETER DIVISION, The Safety Car Heating and Lighting Co., Inc., 1189 Dixwell Avenue, New Haven 4, Connecticut.

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- **"ENTOLETER" Centrifugal Hullers**
- **"ENTOLETER" Impact Mill**
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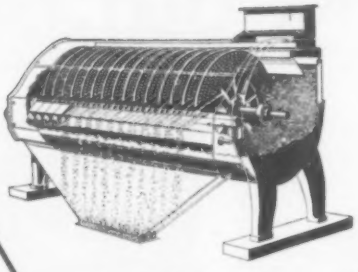
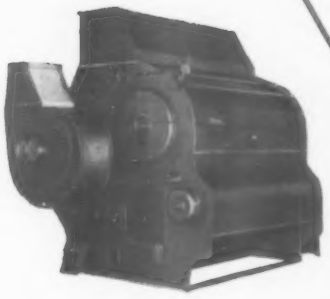


Carter Disc-Oat Separator
Length Separation



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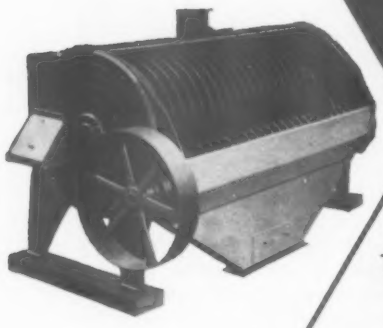
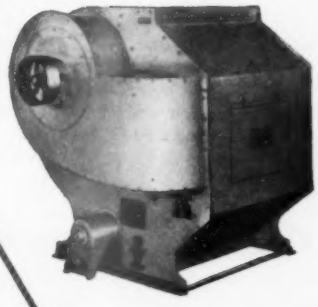


Carter Disc-Seed Separator
Length Separation

Carter Precision Grader
Thickness Separation and Grading



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